

More corroborating facts about the estivation of mussels in dry ground were obtained in other dams of the Fortaleza region.

One must not believe, however, that *all* the mussels in a pond or a dam can endure summer dryness out of water and in dried-out ground at the margin, which is laid bare when the water begins to shrink in consequence of the heat. For only those which have been surprised by the retreating water and which could not follow it toward the center of the basin will bury themselves in the ground, while the rest of the mussels, living at greater depths, remain in the water throughout the entire summer.

Similar resistance to dryness on the part of fresh-water mussels has been described only once, to the best of my knowledge. Deshayes (N. Arch. Mus. Paris, 10; 1874) mentions that a specimen of *Pilsbryoconcha*, that is to say, an anodontine Unionid, sent to Paris from Cambodia by the then long way around the Cape of Good Hope, could be brought back to life by being placed in water.

TWO NEW POLYGYROID HELICOIDS FROM NORTHERN CALIFORNIA

BY S. STILLMAN BERRY

Redlands, California

The seed of future doubt and confusion must ever be implicit in the description and naming of a species, and more especially a subspecies from our western states, bearing no better locality data than the citation of a county, for the western counties are often very large and oftentimes one of them will be found inhabited by a whole series of closely related forms difficult to discriminate with any surety without the most precise information. For example it appears that at least three distinguishable races of the *columbiana-megasoma* group of Polygyroid snails occur within the limits of Humboldt County, California. *P. c. megasoma* was described from this county without specific locale, and it remains in other respects somewhat inadequately known. If I do not go astray in my interpretation of it, the two races described below are receptive candidates for new names.

1) MESODON (*megasoma*, subsp.?) ERITRICHUS nov. Fig. 1 B, C.

DESCRIPTION: Shell small, low-conic, rather thin; base tumid.

Spire low, the slopes nearly straight. Whorls about $6 \pm$, convex, with well-marked sutures, quite regularly enlarging; body-whorl strongly swollen basally, slightly but rather suddenly descending at the suture to the aperture; abruptly constricted just back of the peristome. Lip white in front, well thickened and reflected; rounded anteriorly, flattened below, narrowed parietally and again at the columella, where it is suddenly widened and reflected to kink over and nearly cover the umbilicus. Aperture usually toothless, but a trace of a parietal tooth is sometimes present and an occasional shell has this quite well developed, whitish and arcuate. Terminations of lip connected by a thin but sharply bounded parietal wash of callus, the outer margin of which flares forward in a wide sweep in front of the columella and then abruptly recedes to it. Umbilicus very narrow, hardly permeable, heavily pilose within, and almost completely covered by the columellar flare even in very young shells.

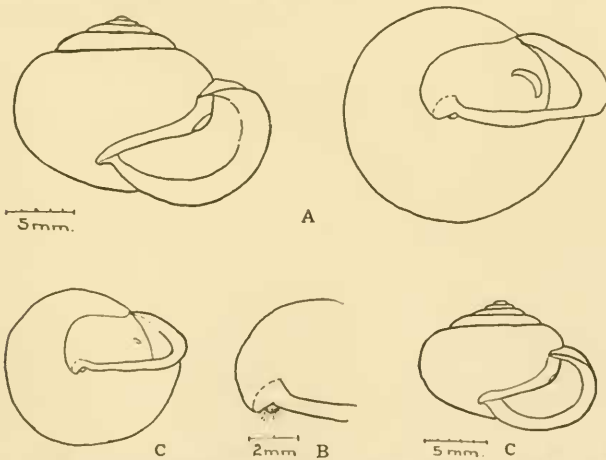


FIG. 1. A, *Mesodon (megasoma, subsp.?) euthales*. C, C, *M. (megasoma subsp.?) critrichius*; camera outlines of the holotypes. B, Camera sketch of columellar region of specimen C, more enlarged.

Embryonic whorls tumid, translucent, polished, closely finely axially wrinkled, with a minute granulation superimposed. On the later whorls these granules become elongate and extremely numerous, showing an alignment in obliquely descending series, and when not crushed or abraded bearing each a short erect acute

hair-like process which gives the surface a fine satiny plush-like surface if clean, but in life causes the adherence of much finely particulate mud or humus, which must be carefully washed away if the true ornamentation is to be seen. Growth-lines, other than those marking the rather frequent resting stages, hardly evident due to the papillation and pilosity, but there is an extremely fine and close axial microscopic wrinkling of the periostracal surface between the papillae.

Color of shell in the main close to Snuff Brown, but paling on the anterior portion of the last whorl to Honey Yellow or Chamois, and to Cream Buff behind the peristome.

MEASUREMENTS:	Maximum	Minimum	Altitude	Number of whorls
	diameter	diameter		
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	
8815. Largest paratype...	16.4	14.0	11.2	6.1
8971. Holotype	14.4	12.2	10.2	5.8
8815. Small paratype	13.4	11.5	9.6	5.5

Holotype: Cat. No. 8971 Berry Collection; Paratypes No. 8815 of same collection; others to be deposited in the collections of Stanford University, the Academy of Natural Sciences of Philadelphia, the United States National Museum, and the private collection of Mr. Allyn G. Smith.

Type-locality: Foot of bluff on ocean side of peninsula at Table Bluff Light, Humboldt County, California; among moist ferns, poison oak, wild blackberries, Equisetum, etc.; Leo Shapovalov and Elden H. Vestal, 13 August 1938; 16 adults, 4 juvenals.

Remarks: This species, which is the dominant Mesodon in the coastal belt of Del Norte and northern Humboldt Counties, appears very distinct from *columbiana* in all its forms, and these two at least I believe to be specifically separable. Probably its nearest ally is *megasoma* "Dall" (1905: 26) as redefined by Pillsbry (1928: 182) to cover a low-conic shell having a very narrow umbilicus and a long strong parietal tooth, and in size apparently somewhat smaller (13.3 mm.) than the commonality of *critrichius*. From this latter our form differs most notably in its peculiar rounded form, swollen body-whorl, and usual obsolescence or ab-

sence of the parietal tooth. Other peculiar features are the curiously kinked columellar reflection of the peristome, the equally unique forward sweep of the parietal callus, and the *extremely* fine and close pelage. It is possible that these features may be partly shared or foreshadowed in *megasoma*, but I have seen no specimens which agree in all respects with Pilsbry's description and figures of the latter (1928: 182, figs. 8, 8a, 9). The nearest apparently are certain lots from extreme southern Humboldt County and northern Mendocino County (notably my No. 8808 from Red Mountain Creek, 1 mile above mouth; L. S., 13 Nov. 1937), which have a strong and long parietal tooth, a much less tumid body-whorl than has *eritrichius*, less copious pilosity, and not so much of a forward flare to the parietal callus. Where best developed the parietal tooth in this lot is peculiar in that it often raises a small secondary unwhitened hummock just outside the anterior termination of the main crescent. Most of these shells are much more depressed than those illustrated by Pilsbry and further collecting in crucial areas may show that yet another race should be recognized in this region.

Pilsbry (p. 183) finds *megasoma* "hardly distinguishable from *P. c. armigera*, which differs chiefly by its remote habitat," but I have seen no Humboldt County examples which were not clearly distinguishable, if not superficially, at least by the microscopic detail of the periostracal sculpturing, which in the southern species (*e.g.*, my 2749 from Big Basin, Santa Cruz County), comprises a close, highly irregular papillation on a glossy surface showing quite coarse growth-wrinkles. Pilsbry's second and more detailed account of *megasoma* (1931: 101) I find difficult to harmonize except on the assumption that his later material was practically all of it representative of the form I now call *eritrichius* rather than typical *megasoma* as first defined by him. True, he does not mention the remarkable flare of the parietal callus, but he does refer to the columellar kink and his localities, excepting Inverness, are all within the known range of *eritrichius*.

To summarize, I am persuaded that in relation to the more widely distributed *columbiana*, both *eritrichius* and *armigerus* are distinct and clear-cut species, but the true position of *megasoma* is still to be demonstrated. It and *eritrichius* seem close akin, yet

in the large series of specimens examined I am unable to establish complete intergradation.

The name chosen is from the Gr. *eri-*, very, + *trichios*, hairy. The type-locality is described by Mr. Shapovalov as being hardly 15 yards from extreme high-tide line.

2) MESODON (*measoma*, subsp.?) EUTHALES NOV. Fig. 1 A.

Description: Shell similar to *eritrichius* in most characters, but with a strongly developed arcuate parietal tooth, a much wider and more sinuate peristome, and the attainment of enormously greater size.

MEASUREMENTS:	Maximum diameter	Minimum diameter	Altitude	Number of whorls
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	
7830. Paratype	20.2	16.6	14.8	6.5
7830. Paratype	19.0	16.0	13.4	6.3
8972. Holotype	18.7	15.5	13.3	6.7
7830. Paratype	17.8	15.0	12.2	6.1

Holotype: Cat. No. 8972 Berry Collection. Paratypes: No. 7830 same collection and another in the collection at Stanford University.

Type-locality: Chaffey Ranch, 7 miles above mouth of Klamath River, Del Norte County, California; in redwoods, Leo Shapovalov, 22 Aug. 1934; 4 adult shells.

Remarks: This is very much the largest *Mesodon* known to me from within the bounds of California, although it is still a pygmy as compared with the giants of Oregon and Washington. I have as yet seen it only from the type-locality where it occurs in association with a very much smaller race¹ scarcely separable from the typical form of the species, except for the presence of a strong parietal tooth. Dimensions of two specimens of the smaller form are appended for comparison:

MEASUREMENTS:	Maximum diameter	Minimum diameter	Altitude	Number of whorls
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	
7831.	13.0	11.1	9.3	6.0
7831. Dead	13.0	11.2	8.7	5.9

¹ A not infrequent phenomenon with this genus in northern California, but one as yet without satisfactory explanation.

The subspecific name is derived from the Gr., *eu*, well, + *thales*, fed.

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LAND SNAILS COLLECTED AT UGANIK BAY,
KODIAK ISLAND

BY WALTER J. EYERDAM

The report on "Land Snails of Kodiak"¹ by S. Stillman Berry in THE NAUTILUS, 1937, pp. 87-88, reminded me that I should contribute the results of a small collection that I made on the shore of Uganik Bay in October, 1924.

At that time I was cooper on the great 2200-ton, 5-masted schooner "Bianca" which had been built during the war for the Australian Government. It had made only one round trip to that southern continent. In 1924 she was sold to a fishing company, and used during the Summer as a herring saltery. The Fall herring fishing was finished at Red Fox Bay on Shuyak Strait, Afognak Island when we got orders to proceed to Halibut Cove which is on Cook's Inlet on the Kenai Peninsula, not far from Seldovia, where we would try our luck at Winter herring fishing. Our ship with most of the Summer and Fall herring stowed in the hold and with about 40 men and women aboard was being

¹ Kodiak is the old Russian spelling. Kodiak is now in general use.